Factors Shaping Qatari Students' Interest in STEM, Business or Public Sector Careers

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Introduction

Throughout the world the need for a highly skilled work force is on the rise and will continue to increase in the years to come (Wooldridge 2006; Ewers 2007; Malecki and Ewers 2007). Alternatively referred to as STEM fields (science, technology, engineering, and mathematics) (Fouad et al., 2010; Goldman and Penner 2014; Ing and Nylund-Gibson 2013) or STEMM fields (the STEM fields plus medicine) (Breiner et al., 2012; Miller and Kimmel 2012; Miller and Solberg, 2012), and placed under the broad category of the Knowledge Economy in Qatar, policymakers and researchers have identified and grouped occupations they believe are key to global competitiveness and central to modern society.[1]

Without question, the need for qualified individuals will continue to grow rapidly in domains that require the necessary STEM knowledge and skills. As such, a background and literacy in STEM has become essential for access to well-paid, high-status jobs (Greenwood et al., 2011). However, the disproportionate influence of STEM raises concerns that not enough STEM workers are being produced who can compete successfully in a global economy, while at the same time science educators in countries around the world struggle with keeping students active and interested in STEM (Boe et al., 2011; Gasiewski et al., 2012; Mahoney 2009). Concerns about shortages of qualified workers are especially salient in Qatar where a sharp deficit of STEM field skills is especially high (Jiwaji, 2014; Osman and Anouze, 2014). Indeed, there is a pressing need for a shift in strategy to redress the situation and counterbalance such shortages of skills required in STEM domains (Ministry of Development Planning and Statistics, 2015).

Building a pipeline for the STEM workforce must begin early in life, and strong linkages have been found between early career aspirations and eventual entrance into a STEM career. Using data from the National Education Longitudinal Study of 1988, Tai and colleagues (2006) found

that roughly half of 8th graders in the study in 1988 followed through with their plans and eventually achieved a degree in a STEM field, while far fewer students with non-STEM aspirations eventually switched into a STEM field. Miller and Kimmel (2012) found similar results using data from the Longitudinal Study of American Youth (LSAY), with 12th grade plans to enter a STEM career having a larger total effect on eventual entrance into a STEM career than student science or mathematics achievement in the 12th grade. In another analysis using the LSAY data, Ing and Gibson (2013) found strong linkages between 7th graders' attitudes toward mathematics and science and their eventual entry into a STEM career.

Student interest in a STEM career is typically framed as a dichotomous situation: either the student aspires to a STEM career or they aspire to any other career (see for example Crisp, Nora and Taggart, 2009; Hilton and Lee 1988; Miller and Kimmel, 2012) with no distinct rivals for career options examined. Additionally, the majority of studies about children's interest in STEM careers have been conducted in North America and the European Union. Yet there are few places in the world with more need for STEM professionals than Qatar, a country that has abundant resources in oil and natural gas but a small citizen population with an even smaller subset trained in the occupations needed to sustain the oil and gas industry. The government of Qatar, as have many places in the Arabian Gulf, has responded to shortages in STEM fields by importing highly skilled workers from North America, Europe, India, the Philippines, and elsewhere. At the same time, reforms in the education sector have resulted in greater emphasis on STEM education and training as fundamental assets for Qatar's future knowledge society (Barnett, 2015; Oxford Strategic Consulting, 2014; Weber, 2015; Wiseman et al., 2014).

In this article we examine interest in a STEM career in Qatar not in isolation, but as one of numerous career choice options. In particular, we contrast interest in a STEM career with the

culturally-relevant alternative career choices of public sector employment and business occupations. We also explore the degree to which factors known to influence career interest in previous studies conducted outside the region – and in particular, the U.S. and Western Europe – apply in Qatar. We aim to answer the following questions:

(1) What motivates students to indicate interest in a STEM over occupations in business or the military?

(2) To what extent does the education system in Qatar shape interest in a STEM career?

Background

Over the past decade the State of Qatar has taken wide strides in an attempt to develop its society into a regional hub of education and modernize its entire education system (GSDP, 2012). In 1998, discontent with the state of education in the country, Qatar's leadership commissioned the RAND Corporation to assess the country's K–12 education system and design reform plans to enable it to be on a par with world-class standards and meet the evolving needs of Qatar (Brewer et al, 2007). In the *Qatar National Vision 2030* (GSDP, 2008), the State of Qatar detailed goals to move from a reliance on its hydrocarbon resources to a Knowledge-Based Economy by the year 2030; at the heart of these plans are the STEM fields. However, there is a shortage of trained Qatari citizens in critical STEM fields (Abdulwahed et al., 2013; GSDP, 2011; Shediac and Samman, 2010; Weber, 2014). Among Qatar's adolescents, there are at least two major rivals for employment in a STEM career: (1) operating one's own private business and (2) public sector employment.

Entrepreneurial business skills are being encouraged by the Qatar government. In line with Qatar National Vision 2030, an initiative – *Intilaaqah* – was launched in 2006 to promote Qatari youth enterprise and entrepreneurial skills, encourage young Qataris to commence their own

business, and provide the necessary training and counseling (GSDP, 2012). The initiative was based on a partnership between youth enterprise programs and private sector entities, such as Qatar Shell, the College of North Atlantic-Qatar, Salam International and the Social Development Centre (GSDP, 2012). A study conducted by the Oxford Strategic Consulting (2015) concluded business is a top future career aspiration for Qatari students at Qatar University. A subsequent study by the Oxford Strategic Consulting revealed that many Qataris aspire to start their own business, for "More than 4 out of 10 Qataris (41%) ranked 'running my own business' as their ideal job role" (Oxford Strategic Consulting, 2016, p. 14). Earlier research carried out by Silatech / Gallup revealed a third of Qatari nationals (33%) aged 15 to 29 intend to run their own business, which constitutes the highest percentage in the Arab region in 2011 (Silatech / Gallup, 2012). These results corroborate findings from a previous study reporting young Qataris were two-and-a-half times as likely to intend launching their own business (Silatech / Gallup, 2010), compared to those in the study that followed.

Public sector employment is also a major competitor with STEM fields for adolescents' interest. Currently, the labor market in Qatar is highly segmented with heavy concentrations of Qataris employed in the public sector, and expatriates dominating the private sector (Bunglawala, 2011; GSDP, 2011; GSDP, 2012). This situation is not unusual for the region, with most of the Gulf Cooperation Countries (GCC) characterized as labor importing and resource rich nations, reliant on foreign workers to compensate for labor shortages. Within Qatar, the share of the migrant population is estimated at 86.5% (World Bank, 2013).

Throughout the Middle East there is a strong preference for public over private sector employment amongst young adults (ASDA'A Burson-Marsteller, 2014; Behar and Mok, 2013; World Bank, 2013). The World Bank (2013) notes that within the region, young people with

adequate resources will wait for public sector jobs to open, rather than taking a job in the private sector, given the differentially high pay offered in public sector jobs and the corresponding low expected productivity. Shediac and Samman (2010) note "the promise of well-paid government employment has encouraged waves of students to apply for public jobs" (p. 7) throughout the GCC. Bunglawala (2011) did a series of qualitative interviews and discussion groups with young Qataris at universities (and recent graduates) and found the reasons most cited by young adults for preferring public sector employment were pay, job security, prestige, and autonomy. Similar findings were concluded in a previous study by Stasz, Eide and Martorell (2007).

Shediac and Samman (2010) note the mismatch between education and the labor market throughout the GCC suggesting that the private sector has had to rely on foreign workers for STEM occupations, because there is "a deficit in much-needed science and engineering graduates, and an excess of social science graduates." (p. 7). The problem is compounded amongst more highly educated young Qataris – with largely non-STEM majors -- in that the private sector is dominated by such industries as construction, retail, and household management, with few positions suitable for young Qataris who attain a university education in a non-STEM field (Bunglawala, 2011).

Despite these obstacles, a major focus of the Qatar National Development Strategy (GSDP, 2011) is to increase employment of Qataris in the private sector and reduce their reliance on public sector employment. Additionally, a major goal for 2030 is to motivate young Qataris to take advantage of post-secondary education (GSDP, 2011). The latter is particularly important as the highest proportion of unskilled and semi-skilled Qataris is employed in the public sector, serving as a disincentive for young Qataris to aspire to higher levels of education (GSDP, 2011).

Literature Review

Social Cognitive Career Theory

Drawing on social cognitive theory (Bandura, 1986, cited in Lent et al., 1994), social cognitive career theory (SCCT) serves as the theoretical framework for this study. SCCT provides a model for determining the factors that shape career choices (Fouad, 2007, p. 543). For this study, the model was utilized to identify, analyze, and understand the relationship between key contextual influences, including students' school and family background experiences, and educational outcomes and career aspirations.

This study tested a partial version of SCCT utilized to explore the potential relationship between high school students' learning experiences and their career aspirations. This was performed whilst taking into account students' individual differences which affect their career choices and aspirations, for example gender, self-efficacy beliefs, learning experiences and academic performance, and sources of support.

Previous Research on Career Choice

We examine the relationship of a set of constructs in this article to Qatari students' career plans. The literature on student interest in STEM careers and interest in science and mathematics in general provides insights into factors that may be important in Qatar. Limited work has been done examining career choice of young adults in Qatar. Many of these explanatory variables are related to the broader SCCT literature.

Gender. Numerous studies have found a relationship between gender and aspirations for a career in a STEM field, with girls typically less likely to aspire to a STEM career than boys (BouJaoude and Gholam, 2013; DeWitt et al., 2013). BouJaoude and Gholam (2013) found that within the Arab region women are more likely to end up in non-science or non-technical positions,

and speculate that women choose not to pursue careers in science because they fear cultural discomfort as well as the social and personal costs of entering a male-dominated field. Sikora and Pokropek (2012) used data from the 2006 Program for International Student Assessment (PISA) and found that across 50 countries, boys had a higher science self-concept than girls, and that amongst science-oriented students, girls were more likely to prefer careers in biology, agriculture, and health, while boys preferred careers in computing, engineering, and medicine. In contrast, Abdulwahed et al. (2013) found that girls are more likely to enroll in engineering courses in Qatar than boys. As of 2011, "labour force participation rates of Qatari men are low and declining—with men leaving the labour force at a young age." (GSDP, 2011, p. 147). In contrast, the labor force participation of Qatari women has grown sharply (GSDP, 2011).

Parent Education. Parents' level of education has been found to have the potential to influence students' educational choices and experiences and to play a key role in the future educational and career decisions of their children (Garriott et al., 2014; Metheny and McWhirter, 2013; Wei-Cheng and Lynette, 2000). Studies carried out by Gibbons and Borders (2010), Raque-Bogdan et al. (2013), and Slaten and Baskin (2014) have demonstrated that the parent's education level directly impacts the career aspirations and career choice of their child. Indeed, there is evidence to suggest that children whose parents attended college (Jodl et al., 2001) hold high educational and career aspirations for their children. Scott and Mallinckrodt (2005), for example, argued that parents who value and support their child's educational level have a significant and positive impact on their children's decisions to pursue a career. Similarly, Spera and colleagues (2009) conducted a study that explored the aspirations of African American, Asian, Caucasian, and Hispanic middle and high school parents for their children's future ambitions; the results indicated that parental education was

significantly and positively related to their aspirations for their children's educational and occupational pursuits.

Parent Occupation. Research on the perceived relationship between the parent's profession and their child's career pursuit has shown that the father or mother's field of work influences the career choices of their children (Leppel et al., 2001; Keller and Whiston, 2008; Mau and Bikos, 2000; Saleem et al., 2014; Wahl and Blackhurst, 2000; Watt et al., 2007; Whiston and Keller, 2004). For example, Moakler and Kim (2014) documented the influence of parental occupation as a predictor of STEM subjects as prime career choices of freshman students. Similarly, evidence presented by Domenico and Jones (2006) and Eccles (2005), for example, confirms the occupational status of the parent is a predictor of the career choice of their teenage girls. Adya and Kaiser (2005) have shown a positive correlation between students' aspirations to have a computing or IT career and their parent's profession.

Student Age or Grade Level. Numerous researchers have examined the flow of individuals out of the STEM pipeline, often concentrating on dropouts from STEM careers at crucial points such as high school, undergraduate, and graduate levels (AIG, 2013, 2015; BHEF, 2012, 2014; Blickenstaff, 2005; Chen, 2013; Hilton and Lee, 1988; Maltese and Tai, 2011; Mervis, 2010; Rask, 2010). Beginning at an even earlier age, other studies have found that children tend to lose interest in STEM fields as they grow older (Baram-Tsabari and Yarden, 2011; George, 2006).

Student Motivational and Behavior Problems. Student motivation and behavior problems have been noted as a major deterrent to higher educational and occupational aspirations in Qatar. For example, GSDP (2011) notes that "High rates of absenteeism, little time spent on homework and a lack of classroom discipline compared with international benchmark countries suggest that many students, especially boys and men, lack the motivation to take advantage of the education

and lifelong learning opportunities that the strategy envisions. Many Qatari students appear to believe that they can secure jobs and make a good living despite low academic qualifications." (p. 131).

Student Educational Aspirations. Student educational aspirations and eventual educational attainment are directly associated with the types of careers to which they can aspire and eventually attain. Within Qatar, low educational aspirations have been associated with the ease – and desirability – of positions in the public sector (GSDP, 2012). Previous studies of STEM careers have found an association between educational aspirations and career choice and entry (Sadler et al., 2012; Tyson et al., 2007; Whalen & Shelley, 2010). Miller and Solberg (2012) found that students who planned on obtaining a Baccalaureate degree or higher while in high school were substantially more likely to eventually be a STEM professional than those who did not plan on graduating from college.

Student Academic Achievement. There are linkages in the existing literature between early academic achievement and eventual employment in a STEM field (Benbow, 2012; Crisp, Nora, and Taggart, 2009; Miller and Kimmel, 2012). Using data from the Longitudinal Study of American Youth (LSAY), Miller and Kimmel (2012) found that students with higher science and mathematics achievement scores were more likely to enroll in a STEM major when they entered college, and were more likely to be a STEM professional at approximately the age of 40. Using data from the National Education Longitudinal Study of 1988, Tai et al. (2006) found a strong relationship between 8th grade mathematics achievement and eventually obtaining a degree in physical science or engineering. In a study of Hispanic students at one university in the United States, Crisp, Nora and Taggart (2009) found an association between high school academic rank

and declaring a STEM major in college and earning a STEM degree. They also found a strong relationship between the college first semester GPA and an eventual STEM degree.

Methodology

Data

This study uses data from the 2012 Qatar Education Study (The Social & Economic Survey Research Institute, 2012a, 2012b, 2012c), which was based on a two-stage probability school sample of students in primary (i.e., 8th or 9th) or secondary schools (i.e., 11th or 12th grade). The mode of data collection was self-administered paper-and-pencil questionnaire, and students selected for the QES also were given a parent questionnaire to take home. This design resulted in 1,848 students and 1,472 parents taking part in the study, and data from the student and parent questionnaires are used for the statistical analysis in this paper.[2] The sampling error was calculated to be +/- 2 percentage points for the student survey and +/- 2.7 percentage points for the parent survey.

Dependent variable

Summary statistics for the dependent and independent variables are listed in Table 1. Students were asked, "What kind of work do you expect to be doing in the future?" and were instructed to select one answer from the following options: (1) join the military; (2) join the police; (3) accountant; (4) teacher; (5) lawyer; (6) university professor; (7) medical doctor; (8) nurse; (9) clerk; (10) IT technician; (11) physical therapist; (12) chef; (13) scientist; (14) businessman/businesswoman; (15) diplomat; (16) other (with an open-ended, "please specify" space); and (98) I do not know. The open-ended responses to the other "please specify" option

were coded into the original categories (including "other"). Responses were collapsed into four categories:

- STEM = (7) medical doctor; (8) nurse; (10) IT technician; (11) physical therapist; and (13) scientist,
- Military/police/diplomat = (1) join the military; (2) join the police; (15) diplomat,
- Business = (3) accountant and (14) businessman/businesswoman, and
- Other = (4) teacher; (5) lawyer; (6) university professor; (9) clerk; (12) chef; (16) other; and (98) I do not know.

Independent Variables

Gender. Students were asked to report their *gender*, placed in the model as a dichotomous variable (female=1, male=0), to test whether there is a difference in career aspirations between boys and girls.

Grade Level (preparatory or secondary) was available as administrative data. 8th and 9th grades were collapsed into preparatory and 11th and 12th grades into secondary.

Mother's and Father's Education. The parent was asked *both for their and their spouse's highest level of education*. These responses were collapsed to Baccalaureate degree or higher versus less than Baccalaureate degree. Separate measures of mother's and father's education are entered in the models as 0= parent does not have a Baccalaureate degree or higher, 1=parent has a Baccalaureate degree or higher.

Parent Employment in STEM Occupation. Students were asked: "What is your father/male (mother/female) guardian's main occupation?" The variable is measured as 0=neither parent employed in a STEM field, 1=one or both parents employed in a STEM field.

Student Motivation Issues. The count of student motivation issues ranges from zero to four and assigns one point to a student for each of the following: (1) coming to school late three or more days in the past four weeks; (2) being absent from school two or more days in the past week; (3) feeling bored most of the time when at school; and (4) strongly or somewhat agreeing that they do not put their maximum effort into studying.

Student Educational Expectations. Students were asked "how far in education do you think you will go?" From these responses an indicator for planning to attain a Baccalaureate degree or higher was created.

Self-Reported Grades. The QES does not include direct measures of student academic achievement such as scores on standardized tests or matched transcripts. We use self-reported grades as a surrogate for academic performance in this analysis. We recognize that while self-reported grades are used frequently in educational research, there are some questions about their reliability with actual grades. However, a meta-analysis of self-reported grades found that self-reported grades generally predict outcome variables in the same manner as actual grades (Kuncel et al., 2005).

Time Spent on Homework. Students were asked to report how much *time they spent each week on homework* for various subjects. We combined the amount of time spent on math and science homework, resulting in a variable ranging from 0 (no time spent) to 16 (20 or more hours).

[Table 1 about here]

Statistical Models

A weighted maximum-likelihood multinomial logit model was constructed for the four category career aspiration variable using STATA 13. The svyset command was used in Stata to

account for the two-stage sampling design and clustering of students within schools. In this analysis, the choice of Business as a career aspiration is treated as the reference category; therefore, we are modeling the odds of a student picking one of the other options versus picking business. We selected business as the reference category because it is one of the main sectors that the Qatar government has identified as a growth area for occupations and employment. Thus, the conditional logits estimated in this analysis are written as:

$$log\left(\frac{p(y_i = STEM)}{p(y_i = Business)}\right) = \beta_0 + \beta_x' \boldsymbol{x_i}$$

$$log\left(\frac{p(y_i = Military/etc.)}{p(y_i = Business)}\right) = \beta_0 + \beta_x' \boldsymbol{x_i}$$

$$log\left(\frac{p(y_i = Other)}{p(y_i = Business)}\right) = \beta_0 + \beta_x' \boldsymbol{x_i}$$

where $p(y_i = STEM)$ is the probability of the *i*th student choosing STEM as their career aspiration. Alternatively, this can be written as:

$$log\left(\frac{P_S}{P_B}\right) = \beta_0 + \beta_x' \boldsymbol{x_i}$$

$$log\left(\frac{P_M}{P_B}\right) = \beta_0 + \beta_x' \boldsymbol{x_i}$$

$$log\left(\frac{P_O}{P_B}\right) = \beta_0 + \beta_x' \boldsymbol{x_i}$$

where P_S is the probability of the *i*th person selecting STEM as their career aspiration; P_B is the probability of selecting Business; P_M is the probability of selecting Military[1]/Police/Diplomat and

[1] From here on we will describe the occupational choice of military/police/diplomat as being "public sector."

P_O is the probability of selecting Other.

On the right-hand side of the equation β_x' are the regression coefficients for the vector of the covariates **x** for the *i*th student where $\boldsymbol{x_i}$ is the vector of covariates given above. Due to the fact that survey weights were included, significance of parameters was tested using the adjusted Wald test (Koch et al., 1975).

Results

Table 2 provides the distribution of selected groups of Qatari students who aspire to a career in STEM, business, the public sector, and all other occupations. Looking first at gender, girls are more likely (16.9%) to aspire to a STEM career than boys (11.2%). Conversely, boys are more likely to aspire to a career in the public sector (52.4%) than are girls (21.9%). Girls are also more likely to aspire to "other" careers (42.9) than boys (21.01).

When grade level is considered, secondary students (21.9%) are more likely than preparatory students (11.8%) to aspire to a career in business, while preparatory students (44.3%) are more likely to aspire to a career in the public sector than secondary students (31.3%). There is no difference based on grade level in STEM or "other" career aspirations.

The home background of the students appears to matter, as students whose mother has a B.A. or higher are significantly more likely to aspire to a career in a STEM field (18.9%) or in business (23.8%) and are less likely to aspire to a career in the public sector or police (27.1%) than those whose mother has less than a baccalaureate. Similarly, students whose father has a Baccalaureate degree or higher are more likely to aspire to a career in a STEM field (20.1%) or in

business (24.4%) and are less likely to aspire to a career in the public sector or police (27.7%) than are those whose father has less than a Baccalaureate degree.

Students who have at least one parent employed in a STEM field are less likely to aspire to a career in the public sector (10.7%) than are those with neither parent employed in a STEM field (38.4%). While twice as many students who have one parent employed in a STEM field (26.8%) aspire to a career in a STEM field than those who do not have a parent similarly employed (13.4%), the difference is not significant given the small number of Qatari students with a parent employed in a STEM field.

Students who plan to obtain a Baccalaureate degree or higher are significantly more likely to aspire to a STEM career (18.1%) or a career in business (22.8%) and less likely to plan on a career in the public sector (30.6%) or other careers (28.5%) than are those who do not plan to graduate from college.

[Table 2 about here]

Table 3 shows the results from the multinomial logistic model discussed above. For each career choice, we show the odds of a Qatari student expressing a desire to enter that career field rather than enter into a career in business. Standard errors are in parentheses. When comparing student aspirations to STEM careers versus business careers, only educational attainment aspirations reach statistical significance. Students who expressed a desire to attain a B.A. or higher degree were more likely to report a desire to enter a STEM career than a business career, perhaps because many STEM careers are known for having strenuous education requirements. Given the results of Table 2, it is perhaps unsurprising that the rest of the indicators fail to show significant differences between the choice of STEM and business fields. Gender (female), grade

level, and parent's career and education choices all positively affected the likelihood of both business and STEM career aspirations. The results of the logistic regression do not suggest that these indicators push students to consider a STEM career any more than a business career. Rather, the results taken overall may mean that students from elite educational backgrounds are more likely to choose high status careers with high educational requirements overall.

When comparing the public sector career choice to business career choice, the results support previous work relating higher socioeconomic student backgrounds and aspirations to more rigorous careers. Females, secondary students, and those whose parents have at least baccalaureate degrees are significantly less likely to choose public sector careers versus business careers. Students who expressed aspirations for advanced educational degrees are also less likely to express a desire to enter a public sector career. Females are more likely to report interest in other career options relative to a career in business.

[Table 3 about here]

Interestingly, students with more motivation issues are less likely to report an interest in public sector careers or other careers relative to business careers. Although the results fail to reach statistical significance, students with motivation issues are also less likely to report aspirations for a STEM career relative to a business career. These results perhaps signify that business is seen as a less demanding career field after educational goals have been achieved. Indicators of school workload or effort fail to reach significance for any career group.

Discussion and concluding thoughts

What started as an investigation into the determinants of an interest in a STEM career in Qatar has evolved into an examination of the factors guiding career interest and aspirations in

STEM, the public sector (e.g., public sector), and business. Using social cognitive career theory as an organizing framework, we identified individual and motivational variables likely to influence career choice. The analysis of the data from the QES 2012 points to a varied and context-dependent portrait of the motivations underlying student interest in a STEM occupation versus one in the public sector or business. The extent to which the education system in Qatar shapes interest in a STEM career could also play a role, although the degree to which we can conclude definitively is hampered by variability in the selection of schools in the sample.[3]

Taking a closer look at the results, it is apparent that operating a private business or seeking a job in the public sector continue to rival interest in a STEM career, regardless of government initiatives to grow a STEM pipeline from school to the workforce. This is revealed partly in the bivariate comparisons between career interests and individual-level and motivational factors. Girls are more attracted to STEM careers, whereas boys tend to be drawn to occupations in the public sector. Although student education aspirations is the only significant result in the multinomial model for STEM, the contrast between business and public sector is significant for several of the individual-level results, notably gender, grade level, and parent education. Taken together, the individual-level factors informed by the SCCT framework overall suggest that students coming from households with highly educated parents are more likely to choose careers with higher status, regardless of the overall educational requirements in the long-term. The results from the motivational factors suggest that those with less motivation are less interested in public sector careers or other careers compared to those in business. While at first this may seem contrary to our expectations, it could, in fact, be the stereotypes associated with a career in the public sector (i.e., adherence to rules and regulations, rigidity) that may drive students with motivational issues to consider alternative career paths.

Throughout the Middle East and North Africa there is a prevailing belief that youth will continue to be attracted to careers in the public sector, such as the public sector. While there may be evidence to support this in several states in the region, our results paint a more nuanced picture of the underlying factors motivating students to pursue occupations outside the public sphere. We find that female students in younger grades who have parents with a B.A. or higher are less likely to pursue a career in the public sector. Those students who already expect to continue on for a B.A. or higher also are less likely to look at a career in the public sector.

Future studies need to evaluate in greater depth how those students who say they want to pursue a STEM career differ from students who want to go into business or the private sector. In conducting this research, we need to investigate what precisely motivates these students to go into fields that have historically been dominated by immigrant workers and expatriates and take on the additional coursework needed to fulfill these jobs. Thus, additional research is required to establish in greater detail the personal motivations and other context-specific factors that foster interest in STEM careers in Qatar. Unpacking the determinants of this is not only useful for Qatar and future planning by the government in terms of educational and workforce planning but to other states in the region, including Saudi Arabia and Kuwait, which rely heavily on the public sector to provide jobs for its citizens.

Endnotes

1. For the remainder of this article we will use the more common notation of STEM to refer to these occupations, but will include the medical professions within the broad rubric.

2. Teachers and administrators also received a questionnaire with 572 teachers and 318 administrators surveyed. Complete details on the survey methodology can be found in (SESRI, 2014). Both Arabic and English versions of the questionnaire are available upon request from the authors.

3. The school system in Qatar is organized into the following categories: (1) Independent; (2) International; (3) Community; and (4) Arabic private. The majority of Qatari students attend the government-financed Independent schools, which are all single-gender schools. Among the Qatari students included in this analysis, 92.1% attended Independent schools, 3.8% International schools, 4.0% Arabic private schools, and .1% Community schools. Due to the small sample size for the other schools types, we did not include a system-level test of school type.

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